UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,613	06/08/2000	Yu-Hung Kao	TI-29099	1311

23494 7590 07/05/2002

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER	
ARMSTRONG, ANGELA A	

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 07/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 09/590,613	**Applicant(s)** KAO, YU-HUNG
	Examiner Angela A. Armstrong	**Art Unit** 2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/08/2000* .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 10, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Kanevsky et al (US Patent No. 5,835,888).

3. Kanevsky et al teaches a statistical language model for very large vocabularies, in which the language model is constructed by splitting words into stems, prefixes and endings.

Regarding claims 1 and 10, at col. 4, lines 14-50, Kanevsky discloses that the system comprises textual data in a machine readable form which can be a large corpus of text, and a vocabulary, such as a dictionary. The vocabulary is used to

create sub-vocabularies of components that comprise stems, endings and prefixes. The textual data and the vocabulary components are used to generate language model statistics, that comprise various sets of statistics: such as stem statistics (trigrams, bigrams, unigrams of a stream of stems that are produced from a stream of words by cutting prefixes and endings); stem/ending and/or prefix/stem/ending n-grams, which reads on "alphabetized text and corresponding phones."

Additionally, at col. 4, line 64 continuing to col. 5, line 21 Kanevsky discloses that for a given stem S, the decoder produces a list of endings E1, E2, E3, . . . , which can be used as the next "word" and that the table of stems and allowed endings contains lists of all endings that can follow a given stem, which reads on "overlapping characters with previous entry are prefix delta encoded"

Regarding claim 14, Kanevsky discloses that the invention relates to speech recognition systems for inflected languages, at col. 1, lines 5-6, which read on "a speech recognizer including an input means for receiving input speech." At col. 4, lines 15-16, Kanevsky discloses that the system comprises textual data in a machine-readable form, which reads on "a processor". At col. 4, lines 28-29, Kanevsky disclose textual data and the vocabulary components are used to generate language model statistics, which reads on "speech recognition models." "said processor responsive to said models and said speech input for providing recognition scores dependent on closet match and selecting closet match", is inherent from the speech recognition system.

At col. 4, lines 14-50, Kanevsky discloses that the system comprises textual data in a machine readable form which can be a large corpus of text, and a vocabulary, such as a dictionary. The vocabulary is used to create sub-vocabularies of components that comprise stems, endings and prefixes. The textual data and the vocabulary components are used to generate language model statistics, that comprise various sets of statistics: such as stem statistics (trigrams, bigrams, unigrams of a stream of stems that are produced from a stream of words by cutting prefixes and endings); stem/ending and/or prefix/stem/ending n-grams, which reads on "models generated from pronunciation dictionary, said pronunciation dictionary comprising alphabetized text and corresponding phones."

Additionally, at col. 4, line 64 continuing to col. 5, line 21 Kanevsky discloses that for a given stem S, the decoder produces a list of endings E1, E2, E3, . . . , which can be used as the next "word" and that the table of stems and allowed endings contains lists of all endings that can follow a given stem, which reads on "overlapping characters with previous entry are prefix delta encoded"

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-4, 9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanevsky in view of Kuhn et al (US Patent No. 6,230,131), hereinafter referred to as Kuhn, and Das (US Patent No. 6,148,283).

6. Regarding claims 2 and 11, Kanevsky teach everything as claimed in claims 1 and 10. Kanevsky do not specifically teach that the dictionary includes a rule set to convert text to phones for text not in the dictionary. However, text to phoneme conversion is well known in the art.

In a similar field of endeavor, Kuhn discloses a method for generating spelling-to pronunciation decision tree, which decision trees are used to store a series of yes-no questions (which reads on the "rule set") that can be used to convert spelled word letter sequences into pronunciations (abstract), for use in a speech recognition system to allow the user to add additional words to the recognition dictionary (col. 1, lines 49-55), which reads on "convert text to phones for text not in the dictionary." Kuhn teaches that implementation of the method allows the user to add words to the recognition dictionary without having to understand the nuances of building a phonetic transcription (col. 1, lines 49-55).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kanevsky to implement a method for converting spelled word letter sequences into pronunciations, for use in a speech recognition system to allow the user to add additional words to the recognition

dictionary, as taught by Kuhn, for the purpose of allowing the user to add words to the recognition dictionary without having to understand the nuances of building a phonetic transcription, as suggested by Kuhn.

Kanevsky do not specifically teach error encoding of the entries different from the rule set. However, utilizing an error signal in a coding scheme is well known in the art.

In a similar field of endeavor, Das teaches a system for vector quantization, which utilizes error vectors in the coding scheme. At col. 7, lines 1-4, Das teaches that the difference between a target vector and an input vector forms an error vector, which represents the distortion between an input and output of the coding system.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kanevsky to utilize an error signal in a coding scheme, as taught by Das, for the purpose of providing an efficient means for implementing a coding scheme.

Regarding claims 3 and 12, at col. 4, line 64 continuing to col. 5, line 21 Kanevsky discloses that for a given stem S, the decoder produces a list of endings E1, E2, E3, . . . , which can be used as the next "word" and that the table of stems and allowed endings contains lists of all endings that can follow a given stem, which reads on "encoded set is prefix data encoded."

Regarding claims 4 and 13, at col. 3, lines 44-45, Kanevsky discloses stems will always be followed by the symbol "<" and endings preceded by the symbol ">", **which reads on "delimiter character between each entry."**

Regarding claim 9, Kanevsky discloses that the invention relates to speech recognition systems for inflected languages, at col. 1, lines 5-6, **which read on "a speech recognizer." At col. 4, lines 15-16,** Kanevsky discloses that the system comprises textual data in a machine-read**able form, which reads on "a processor".**

At col. 4, lines 14-50, Kanevsky discloses that the system comprises textual data in a machine readable form which can be a large corpus of text, and a vocabulary, such as a dictionary. The vocabulary is used to create sub-vocabularies of components that comprise stems, endings and prefixes. The textual data and the vocabulary components are used to generate language model statistics, that comprise various sets of statistics: such as stem statistics (trigrams, bigrams, unigrams of a stream of stems that are produced from a stream of words by cutting prefixes and endings); stem/ending and/or prefix/stem/ending n-grams, **which reads on "pronunciation dictionary comprising alphabetized text and corresponding phones."**

Additionally, at col. 4, line 64 continuing to col. 5, line 21 Kanevsky discloses that for a given stem S, the decoder produces a list of endings E1, E2, E3, . . . , **which can be used as the next "word" and that the table of stems and**

allowed endings contains lists of all endings that can follow a given stem, which reads on "overlapping characters with previous entry are prefix delta encoded"

Kanevsky do not specifically teach that the dictionary includes a rule set to convert text to phones for text not in the dictionary. However, text to phoneme conversion is well known in the art.

In a similar field of endeavor, Kuhn discloses a method for generating to-to pronunciation decision tree, which decision trees are used to store a series of yes-no questions (which reads on the "rule set") that can be used to convert spelled word letter sequences into pronunciations (abstract), for use in a speech recognition system to allow the user to add additional words to the recognition dictionary (col. 1, lines 49-55), which reads on "convert text to phones for text not in the dictionary." Kuhn teaches that implementation of the method allows the user to add words to the recognition dictionary without having to understand the nuances of building a phonetic transcription (col. 1, lines 49-55).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kanevsky to implement a method for converting spelled word letter sequences into pronunciations, for use in a speech recognition system to allow the user to add additional words to the recognition dictionary, as taught by Kuhn, for the purpose of allowing the user to add words to the recognition dictionary without having to understand the nuances of building a phonetic transcription, as suggested by Kuhn.

Kanevsky do not specifically teach error encoding of the entries different from the rule set. However, utilizing an error signal in a coding scheme is well known in the art.

In a similar field of endeavor, Das teaches a system for vector quantization, which utilizes error vectors in the coding scheme. At col. 7, lines 1-4, Das teaches that the difference between a target vector and an input vector forms an error vector, which represents the distortion between an input and output of the coding system.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kanevsky to utilize an error signal in a coding scheme, as taught by Das, for the purpose of providing an efficient means for implementing a coding scheme.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuhn (US Patent No. 6,230,131) in view of Das (US Patent No. 6,148,283).

8. Kuhn discloses a method for generating to-to pronunciation decision tree, which decision trees are used to store a series of yes-no questions (which reads on the "rule set") that can be used to convert spelled word letter sequences into pronunciations (abstract), for use in a speech recognition system to allow the user to add additional words to the recognition dictionary (col. 1, lines 49-55), which reads on "convert text to phones for text not in the dictionary."

Kuhn does not specifically teach error encoding of the entries different from the rule set. However, utilizing an error signal in a coding scheme is well known in the art.

In a similar field of endeavor, Das teaches a system for vector quantization, which utilizes error vectors in the coding scheme. At col. 7, lines 1-4, Das teaches that the difference between a target vector and an input vector forms an error vector, which represents the distortion between an input and output of the coding system.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kuhn to utilize an error signal in a coding scheme, as taught by Das, for the purpose of providing an efficient means for implementing a coding scheme.

9. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuhn et al (US Patent No. 6,230,131) in view of Das (US Patent No. 6,148,283) in further view of Kanevsky (US Patent No. 5,835,888).

10. Regarding claim 6, Kuhn and Das teach everything as claimed in claim 5. Kuhn and Das do not specifically teach prefix delta encoding.

In a similar field of endeavor, Kanevsky et al teaches a statistical language model for very large vocabularies, in which the language model is constructed by splitting words into stems, prefixes and endings. Specifically, at col. 4, line 64 continuing

to col. 5, line 21 Kanevsky discloses that for a given stem S, the decoder produces a list of endings E1, E2, E3, . . . , which can be used as the next "word" and that the table of stems and allowed endings contains lists of all endings that can follow a given stem, which reads on "prefix delta encoded".

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kuhn to implement prefix encoding as taught by Kanevsky, for implementation in speech recognition systems for inflected languages, which have very large vocabularies.

Regarding claim 7, Kuhn and Das do not specifically teach a delimiter character between each entry. However, implementation of delimiters within portions of text or data is well known in the art.

In a similar field of endeavor, Kanevsky et al teaches a statistical language model for very large vocabularies, in which the language model is constructed by splitting words into stems, prefixes and endings. Specifically, at col. 3, lines 44-45, Kanevsky discloses stems will always be followed by the symbol "<" and endings preceded by the symbol ">", which reads on "delimiter character between each entry."

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kuhn to implement delimiters between the data as taught by Kanevsky, for implementation in speech recognition systems for inflected languages which have very large vocabularies.

Regarding claim 8, Kuhn discloses decision trees are used to store a series of yes-no questions that can be used to convert spelled word letter sequences into pronunciations (abstract), for use in a speech recognition system to allow the user to add additional words to the recognition dictionary (col. 1, lines 49-55), which reads on "alphabetized text and corresponding phones."

Kuhn and Das do not specifically teach that "overlapping characters with previous entry are prefix delta encoded".

At col. 4, line 64 continuing to col. 5, line 21 Kanevsky discloses that for a given stem S, the decoder produces a list of endings E1, E2, E3, . . . , which can be used as the next "word" and that the table of stems and allowed endings contains lists of all endings that can follow a given stem, which reads on "overlapping characters with previous entry are prefix delta encoded"

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kuhn to implement prefix encoding as taught by Kanevsky, for implementation in speech recognition systems for inflected languages, which have very large vocabularies.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Glickman et al (US Patent No. 4,342,085) discloses stem processing for data reduction in a dictionary storage file.

Gupta et al (US Patent No. 6,243,680) discloses a method and apparatus for obtaining a transcription of phrases through text and spoken utterances, which utilize text to phoneme rules.

Shaw et al (US Patent No. 6,363,342) discloses a system for developing pronunciation data, based on a spelled word input.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is 703-306-0377.

AAA
June 28, 2002

Marsha D Banks Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600